

Notice of Allowability

Application No.

10/735,890

Examiner

Kyle M. Riddle

Applicant(s)

OTTERSBACH ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 10.
3. ☒ The drawings filed on 15 June 0204 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Charles Muserlian on 2 September 2004.

The application has been amended as follows:

Specification

2. The disclosure amended as follows:
 - Page 1, first full paragraph, the last sentence of the paragraph beginning with "The invention further concerns..." is deleted;
 - Page 2, first full paragraph, line 7 of the paragraph, "while" now reads --whereas--;
 - Page 2 of the Preliminary Amendment, line 2 of the paragraph, "No. which" now reads --No. 6,701,877 which--.

Claims

3. New claim 10 has been rewritten as follows:

Claim 10 (currently amended)

A control device for adjusting a relative angular position of a driven shaft, particularly a camshaft of an internal combustion engine, with the following features:

 - the control device comprises a drive pinion that is rotatably connected to the shaft,

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- the control device comprises an adjusting element (1) for the angular adjustment of the drive pinion relative to the shaft, and further comprises chambers (2, 3) that are alternately supplied with hydraulic fluid,
- the control device further comprises a control valve (6) for actuating the adjusting element (1), said control valve being connected to the chambers (2, 3) of the adjusting element (1) through pressure medium channels (4, 5),
- the control valve (6) comprises a valve body (7) comprising working connections A and B for the pressure medium channels (4, 5), a delivery connection P for the supply of hydraulic fluid and a discharge connection T for the discharge of hydraulic fluid,
- the control valve (6) further comprises a sliding valve control piston (8) for setting different hydraulic resistances W between the individual connections, in a first adjusted position of the valve control piston (8), the connections between the connections P and A and between the connections B and T have a low resistance W and the connection between the connections P and B and between the connections A and T have a high resistance W,
- in a second adjusted position of the valve control piston (8), the connections between the connections between P and B and between the connections A and T have a low resistance W and the connections between the connections P and A and between the connections B and T have a high resistance W,
- in the third adjusted position of the valve control piston (8), the connections between the connections A and T and between the connections B and T and the connections

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between the connections P and A and between the connections P and B have a high resistance W,

wherein in the third position,

- either to compensate for fluid leakage V from the pressure medium channel (4) at the connection A, a groove (16) and control regions (17, 17') of the valve control piston (8) are arranged unsymmetrical so that, the resistance W between the connections P and A is lower than the resistance W between P and B,
- or to compensate for fluid leakage V from the pressure medium channel (5) at the connection B, a groove (16) and control regions (17, 17') of the valve control piston (8) are arranged unsymmetrical so that, the resistance W between the connections P and B is lower than the resistance W between P and A.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance: The claimed combination including the limitations of a control valve for adjusting the relative angular position of a driven shaft comprising compensating for fluid leakage through one of two pressure connections for delivery of pressurized fluid by arranging the groove and control regions or lands of the control piston unsymmetrical in a third or holding position so that fluid will flow easier toward the specified pressure connection to obtain the desired compensation of fluid leakage, is not disclosed or rendered obvious over the art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of 4 patents.

- Moriya et al. (U.S. Patent 5,483,930) disclose a valve timing control device that supplies fluid to the advancing chamber from a control valve piston to compensate for leakage.

- Butterfield et al. (U.S. Patent 5,657,725) disclose a VCT system with a spool valve body for controlling hydraulic loads.

- Schafer et al. (U.S. Patent 6,055,950) disclose an arrangement for controlling the changing of valve timing using different spool valves and check valves.

- Ottersbach et al. (U.S. Patent 6,701,877) disclose a camshaft control device with leakage compensation by use of a connecting duct.

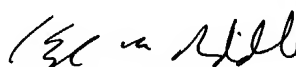
Communication

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (703) 306-3409. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kyle M. Riddle

Examiner

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kmr



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